REMARKS

CLAIM STATUS

Claims 1-3 and 5-7 are pending in this application and claim 1 is independent. Claims 4 and 8 have been canceled without prejudice or disclaimer and the subject matter of these canceled claims has been essentially incorporated into amended independent claim 1, such that amended independent claim 1 clearly includes no new matter. Claims 2 and 5-7 have only been amended as to form and these amendments also do not introduce any new matter.

SUMMARY OF THE OFFICE ACTION

The outstanding Office Action is a third non-final Action that acknowledges the claim for priority and receipt of the corresponding priority documents and acknowledges the consideration of the reference included with the IDS filed July 10, 2008.

In addition to these formal matters, the outstanding Action presents a rejection of claims 1-8 under 35 U.S.C. § 103(a) as being unpatentable over Japanese Patent Publication No. 54-127769 (hereinafter JP '769 to be consistent with the outstanding Action) in view of Japanese Patent Publication No. 09-89260 to Yamada (hereinafter JP '260 to be consistent with the outstanding Action) in further view of Japanese Patent Publication No. 03-97105 (hereinafter JP '105 to be consistent with the outstanding Action).

REJECTION OF CLAIMS 1-8

Page 2 of the outstanding Action sets forth the above-noted rejection of claims 1-8 under 35 U.S.C. § 103(a) as being unpatentable over JP '769 in view of JP '260 in further view of JP '105. This rejection is considered to be moot as to canceled claims 4 and 8 and is traversed as to claims 1-3 and 5-7.

As an initial matter, it is noted that the reliance on JP '769 in view of JP '260 is similar to the reliance on these same references in the Action mailed March 7, 2008.

The Examiner has added JP '105 and his interpretation that 8 is a single blower providing cooking circulation and exhaust from an oven and that 14 is an exhaust port damper with the

exhaust port being "in the external circulation passage" and the "fan [sic, blower] placed outside the 'innermost side wall.'" In order to provide the translations required by MPEP § 706.02 II, machine translations of JP '769 (Japanese Patent Publication No. 54-127769) and JP '105 (Japanese Patent Publication No. 03-97105) are included with this Amendment to provide a completed record.

The Examiner's rationale at page 2 of the outstanding Action is that the artisan would somehow "use a single blower arrangement, after the manner of JP '105, to simplify construction and control" apparently of JP'769 as modified by JP '260.

What is missing from this rationale is even an attempt to explain how the artisan would have modified JP '769 as modified by JP '260 to arrive at the claimed subject matter. As explained in MPEP §706.02(j), in order to support a rejection under 35 U.S.C. 103(a), the examiner is to identify "the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter." As explained here, such an express identification of proposed modifications is necessary because "[i]t is important for an examiner to properly communicate the basis for a rejection so that the issues can be identified early and the applicant can be given fair opportunity to reply." This is more than mere guidance by the MPEP as 35 U.S.C. § 132 requires that the applicant be notified of the reasons for the rejection of the claim so that he or she can decide how best to proceed. Clearly, setting forth all relied on rationales, including the exact proposed reference modifications, is required by the statute and not something that is left to the Examiner's discretion.

Also, besides not identifying specific reference modifications that are proposed, the outstanding Action appears to be trying to improperly view the teachings as to the JP '105 blower 8 in the abstract rather than in the "context of the teaching of the entire reference" that the case law requires. *See In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000).

In this last regard, JP '105 is not directed to cooking by the striking of food with heated gas as in JP '769. This is clear from the following descriptions that appear under the heading "Preferred embodiments" beginning at page 3 of the enclosed English translation of JP '105:

> As shown in Figs. 1 to 3, in the cooker of the present utility model, a heating chamber 2 is formed, inside an apparatus body 1, with a top plate 3

> thereof part of which is formed into a protruding portion serving as a heater cover 4, and a cooking heater 5 is disposed below the heat cover 4. The heater cover 4 is a reflection plate that reflects heat of the cooking heater 5"

Page 4 of the translation (starting at line 5) then explains the "operation of the cooker as constructed above" as follows:

> First, when cooking is started or in an initial phase, hardly any gas or smoke is generated from foods; thus, the switching damper 14 is placed in a position blocking the exhaust circulation duct 11 or in a middle position as shown in Fig. 2, and the exhaust centrifugal fan 8 is rotated slowly. When cooking is in progress or in a final phase, the switching damper 14 is switched to a position blocking the exhaust port 10 as shown in Fig. 3 so as to permit the air exhausted by the exhaust centrifugal fan 8 to circulate into the heating chamber 2 through the exhaust circulation duct 11 and the opening 12; thus, gas contained in the exhausted air is decomposed by the deodorization catalyst 7, and heated air inside the heating chamber 2 is prevented from escaping out of the apparatus, leading to reduced time for cooking.

Clearly the radiating heat directed from the cooking heater 5 and the heat cover 4 to the food is what plays the principal cooking role in JP '105, and the circulation of gas that can only occur after an initial cooking phase only plays a minor cooking role as to then "preventing the escape of the heat inside the heating chamber 2." The main reason for circulating the air after cooking has begun is so that "the gas contained in the exhausted air [generated during cooking] is sufficiently decomposed by the deodorizing catalyst, with the result that the exhausted air is deodorized" as noted at page 3, lines 1-6 of the translation. After this deodorizing, the damper is switched.

Moreover, the blower 8 of JP' 105 is operating at a low rotation rate ("the exhaust centrifugal fan 8 is rotated slowly") not suitable to provide hot gas for cooking at least for a time period marking the initial phase of cooking with the damper opening the exhaust port "as shown by Fig. 2." The outstanding Action has clearly misinterpreted Fig. 2 as just providing an exhaust function when it is actually taught to show the damper position during the initial phase of cooking as well as after deodorization.

Furthermore, it appears to be next to impossible to use any of these actual teachings of JP '105 with the complex four interrelated but still possibly independent cooking arrangements

(high frequency wave cooking, heater 17 cooking, heater 22 hot air cooking, and/or heater 14 steam cooking, see the included translation at page3, line 19 to page 4, line 30) of JP '769, at least not without changing the basic operating principle of JP '769 that is prohibited. *See In re Ratti*, 270 F.2d 810, 813, 123 USPQ 349, 352 (CCPA 1959). Moreover, reference modifications that would render a reference unsatisfactory for its intended purpose are also prohibited. *See In re Gordon*, 733 F.2d 900, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

In addition, the present invention achieves cooking by striking food to be cooked with high-temperature gas, and for this very purpose the blower is to circulate the cooking gas inside the heating chamber through the external circulation path at high speed through the entire cooking time, contrary to these teachings of JP '105. The circulated air stream itself ends up as the exhausted stream, and therefore no time lag is produced as would be if the blower were started anew. Moreover, since what is changed with the damper is the destination of the air stream, no time lag is produced as would be if their direction were changed. It is thus possible to exhaust the high-temperature gas inside the heating chamber without delay, thereby to shorten the time before the door can be opened. None of JP '769, JP '269, and JP '105 teaches this benefit.

Furthermore, independent base claim 1 is concerned with a "control unit that controls the blower and the damper such that, during cooking, the damper is in a position to close the exhaust port and the blower operates to return the gas sucked in through the suction port to the heating chamber." The teachings of JP '105 include no such exhaust port closure during the initial cooking phase. Also, independent base claim 1 requires that "when the door is opened during cooking, the damper is brought into a position to open the exhaust port and the blower operates to exhaust the gas sucked in through the suction port through the exhaust port in the open state" and there is no teaching of any exhaustion of gas through the exhaust port opened by moving the JP '105 damper until gas circulation to eliminate odors is completed.

Accordingly, JP'105 is incompatible with both JP '620 and JP '769 and the outstanding Action fails to present the "articulated reasoning with some rational underpinning to support the legal conclusion of obviousness" required under *KSR Int'l v. Teleflex Inc.*, 127 S.Ct. 1727, 82 USPQ.2d 1385, 1396 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336

(Fed. Cir. 2006)). Thus, withdrawal of the improper rejection of amended independent claim 1 8 under 35 U.S.C. § 103(a) as being unpatentable over JP '769 in view of JP '260 in further view of JP '105 is respectfully submitted to be in order.

Furthermore, as claims 2, 3, and 5-7 depend directly from amended independent claim 1, these dependent claims are respectfully submitted to be improperly rejected under 35 U.S.C. § 103(a) as unpatentable over JP '769 in view of JP '260 in further view of JP '105 for at least the same reason as noted above as to parent amended independent claim 1. Accordingly, the withdrawal of the improper rejection of dependent claims 2, 3, and 5-7 under 35 U.S.C. § 103(a) as unpatentable over JP '769 in view of JP '260 in further view of JP '105 is also respectfully requested.

In addition, it is noted that claims 2, 3, and 5-7 add further features to those of base independent claim 1, which further features are also not taught or suggested by the applied references considered alone or together in any proper combination. Accordingly, the withdrawal of the improper rejection of dependent claims 2, 3, and 5-7 under 35 U.S.C. § 103(a) as being unpatentable over JP '769 in view of JP '260 in further view of JP '105 is further respectfully requested because of these added features.

CONCLUSION

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Raymond F. Cardillo, Jr., Reg. No. 40,440 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Dated: June 25, 2009

Respectfully submitted,

By _____
Charles Gorenstein
Registration No.: 29,271
BIRCH, STEWART, KOLASCH & BIRCH, LLP
8110 Gatehouse Road
Suite 100 East
P.O. Box 747
Falls Church, Virginia 22040-0747
(703) 205-8000
Attorney for Applicant

Attachments: English Translation of JP-A-54-127769
English Translation of JP--U-H3-97105

English Translation of Substantially the Whole of JP-A-54-127769,
Published on October 3, 1979

1. Title of the invention

COOKING APPARATUS

2. What is claimed is:

(1) A cooking apparatus, wherein

inside a heating chamber, there are provided a heater and a circulation fan that blows air to the heater,

outside the heating chamber, there is formed a steam supply passage,

the steam supply passage is made to communicate with the heating chamber such that convection occurs between inside the steam supply passage and inside the heating chamber, and

steam is supplied from a steam generation device into the steam supply passage somewhere midway therealong.

(2) The cooking apparatus according to claim 1,

wherein a position of an outflow hole of the steam supply passage is provided on an air inlet side of the circulation fan.

(3) The cooking apparatus according to claim 1,

wherein

in an upper part inside the heating chamber, a hot-air passage is formed with a partition formed of metal or a heat-resistant insulating material,

the heater and the circulation fan are provided in the hot-air passage, and

an air inlet of the hot-air passage is located on an outflow hole side of the steam supply passage.

(4) The cooking apparatus according to any one of claim 1 or 3,

wherein steam is intermittently supplied during operation of the circulation fan.

3. Detailed description of the invention

The present invention relates to a novel cooking apparatus that is realized by adding a steam supply function to a cooker in which hot air is circulated inside a heating chamber, with a view to expanding the range of cooking.

The invention will now be described by way of an illustrated embodiment. In Fig. 1, (1) represents a heating device body that is provided with an outer case (2), which forms an outer shell, and a heating box (4), which has a heating chamber (3) formed inside it. (5) represents a turntable that is provided in a lower part inside the heating chamber (3) and that is rotated at a speed of several revolutions per minute by a turntable drive motor (6) provided in a bottom part of the body (1) via a drive shaft (5A). (7) represents a magnetron that supplies a high frequency wave into the heating chamber (3) via a waveguide (8). (9) represents a high frequency wave supply opening. (10) represents a lamp that illuminates the interior of the heating chamber (3) through small holes (11) in a side surface thereof. (12) represents a hermetic water tank that is removably provided inside the body (1). (13) represents a vaporization chamber that has an electrothermal heater (14) provided in a bottom part thereof and that communicates with the water tank (12) through a pan (15) and a pipe (16) to be fed with water from the water tank (12) so as to keep a constant water level.

(17) represents an annular electrothermal heater that is provided in a bottom part inside the heating chamber (3) so as to enclose the drive shaft (5A). (18) represents a guide frame with a U-shaped longitudinal cross section that is provided in an upper central part inside the heating chamber (3), i.e. in such a position as to cover the supply opening (9) from below, that is formed of metal or a heat-resistant insulator such as porcelain, and that has an air exhaust opening (19) previously formed in a part thereof below the supply opening (9). (20) represents an air intake opening that is formed between an end part of the guide frame (18) opposite to the air exhaust opening (19) and the ceiling surface of the heating chamber (3). (21) represents a guide portion that is formed in a tip of the guide frame (18) at the air exhaust opening (19) side. (22) represents a heater that is previously disposed inside the guide frame (18) and that has a plurality of ventilation holes (23) for heat exchange formed in the entire portion thereof.

(24) represents a circulation fan that is rotated by a drive shaft (26) of a motor (25) which is so provided as to penetrate the waveguide (8) vertically, and that is located in an

entrance part, i.e. a part close to the air intake opening (20), of the guide frame (18). (27) represents a circulation fan case which is provided with an air outlet (28) at its one end and an air inlet (29) at the center of its lower surface.

(30) represents a heat-resistant cover that blocks the supply opening (9). (31) represents a through hole that is provided in a side surface of the heating chamber (3) below a part thereof corresponding to the turntable (5). (32) represents a through hole that is provided similarly in a side surface of the heating chamber (3) in the vicinity of and below the circulation fan (24). (33) represents a supply tube made of metal that is provided outside the heating chamber (3), with its interior space used as a steam supply passage (S), with its inflow hole (34) connected to the rim of the through hole (31), and with its outflow hole (35) connected to the rim of the through hole (32).

(36) represents a discharge tube that is provided so as to penetrate the bottom surface of the supply tube (33), with its lower end part facing inside the vaporization chamber (13). (37) and (38) represent exhaust holes that are provided in the ceiling surface of the heating chamber (3) and in the top surface of the outer case (2). (39) represents an exhaust duct through which those ventilation holes communicate with each other and in which is housed a temperature detection portion (40) of a cooking temperature adjuster (unillustrated) which controls the energization of the heaters (17) and (22) and the motor (25).

The operation with the above structure will now be described. First, to perform high-frequency-wave cooking alone, when a magnetron (7) is oscillated, a high frequency wave propagates through a waveguide (8) and radiates from the high frequency wave supply opening (9) into the heating chamber (3), so that food placed on the turntable (5) is heated and cooked efficiently.

Next, when the heater (17) is energized, the turntable (5) is heated from the bottom side thereof and its temperature becomes high; thus the food placed on the turntable (5) is heated from below. This, in combination with high-frequency-wave heating, makes it possible to heat food from outside and from inside simultaneously, and thus to achieve cooking with less uneven broiling and in a shorter time.

Next, with the energization to the heater (17) stopped or continued intermittently, when the heater (22) is energized, the circulation fan (24) is operated synchronously; thus air sucked in through the air inlet (29) of the fan case (27) becomes hot when passing through the ventilation holes (23) of the heater (22), and is then directed downward by the guide portion (21) of the guide frame (18) so as to be blown out downward through the air exhaust opening (19).

Thus, by the hot air thus blown out, the food on the turntable (5) is heated from the surface thereof and it is thus possible to burn the surface of the food; moreover, as indicated by arrows in the diagram, the hot air circulates inside the heating chamber (3), so that the atmospheric temperature inside the heating chamber (3) gradually rises, and this makes it possible to perform cooking with hot air. Radiating a high frequency wave during cooking using hot air enhances the food heating efficiency.

Note that, since the temperature detection portion (40) of the temperature adjuster (unillustrated) is housed in the exhaust duct (39), needless to say, the hot air temperature inside the heating chamber (3) is detected so that the energization to the motor (25) and the heaters (17) and (22) are controlled in such a way as to keep the atmosphere there at a predetermined cooking temperature previously set by a user.

Next, when the heater (14) is energized, a small quantity of water stored in the vaporization chamber (13) is rapidly heated to be vaporized, so that steam blows out from the tip of the discharge tube (36) towards an upper part of the steam supply passage (S). Here, if the atmospheric temperature of the heating chamber (3) has already been made high by the heater (17) or (22), hot steam is additionally supplied into that atmosphere to fill inside the heating chamber (3); thus, food can be cooked efficiently using heated steam. As steam is discharged through the steam supply passage (S), hot air inside the heating chamber (3) flows into the steam supply passage (S) from the inflow hole (34); thus, it is possible to efficiently introduce, without cooling, the steam discharged from the discharge tube (36).

In particular, when the circulation fan (24) is operated, since the air intake of the circulation fan (24) is directly above the outflow hole (35), steam can be efficiently heated and discharged in a concentrated manner through the air exhaust opening (19) of the guide frame (18); moreover, a larger quantity of air flows through the steam supply passage (S), and thus steam can be efficiently extracted.

Note that intermittent supply of steam during high-frequency-wave oscillation and during energization to the heaters (17) and (22) makes it possible to keep the food moderately dry during high-frequency-wave cooking; moreover, during electrothermal cooking, hot steam as is acts on food without decreasing the temperature of hot air; this is suitable in particular for cooking in which a large quantity of water is required.

Fig. 2 shows another embodiment of the present invention; compared with the embodiment described above, this embodiment differs slightly in the shape of the guide frame (18) and the position of the outflow hole (35), but achieves a similar effect. Note that the means for generating steam is not limited in any way to the structure of the above-described

embodiment.

As described above, according to the present invention, cooking can be performed with hot air and steam, and in addition, since the steam generation device is connected to the supply passage that, along with the interior of the heating chamber, forms a circulation passage, it is possible to efficiently supply the generated steam into the heating chamber; thus, it can be expected that various modes of cooking are performed in a shorter time.

4. Brief description of the drawings

Fig. 1 is a central longitudinal sectional view of a cooking apparatus according to an embodiment of the present invention; Fig. 2 is a central longitudinal sectional view according to another embodiment of the invention.

In the drawings, (1) represents a heating device body; (3) represents a heating chamber; (13) represents a vaporization chamber; (14), (17), and (22) represent heaters; (18) represents a guide frame; (24) represents a circulation fan; (34) represents an inflow hole; (35) represents an outflow hole; (33) represents a supply tube; and (S) represents a supply passage.

Among different drawings, the same reference signs indicate either identical or corresponding parts.

(19) Japan Patent Office (JP)
(12) Publication of utility model (U)

(11) Utility model application publication
JP-H3-97105

(51) Int. Cl.[5] Identification number JPO file number
F 24 C 7/04 A 7153-3L

(43) Publication date: H3 (1991) October 4

Substantive examination: Not requested, Number of claims: 1 (Total number of pages: 1)

(54) Title of the utility model Cooker

(21) Utility model application JP-H2-4141

(22) Filing date January 19, 1990 (H2)

(72) Inventor Taisuke Morino c/o SHARP KABUSHIKI KAISHA
22-22 Nagaike-Cho, Abeno-Ku, Osaka City, Osaka

(71) Applicant SHARP KABUSHIKI KAISHA 22-22 Nagaike-Cho, Abeno-Ku, Osaka City, Osaka

(74) Agent(s) Patent attorney Masaru Umeda, and two others

SPECIFICATION

1. Title of the Utility Model

Cooker

2. Scope of Claim for the Utility Model

1. A cooker provided with: an exhaust fan for exhausting air inside a heating chamber; an exhaust path that guides the air exhausted by the exhaust fan to an outside of the apparatus; and a deodorization catalyst that is provided inside the exhaust path, and that removes an odor or a smoke contained in the exhausted air,

wherein a circulation path is provided, in a stage succeeding the deodorization catalyst of the exhaust path, that lets the exhausted air circulate into the heating chamber, and

a switching damper is provided, in a branching portion branching into the circulation path and the exhaust path, that switches a path guiding the exhausted air between the circulation path and the exhaust path.

3. Detailed Description of the Utility Model

<Industrial applicability>

The present utility model relates to a cooker provided with: an exhaust fan for exhausting air inside a heating chamber; an exhaust path that guides the air exhausted by the exhaust fan to an outside of the apparatus; and a deodorization catalyst that is provided inside the exhaust path, and that removes an odor or a smoke contained in the exhausted air.

<Description of the prior art>

An example of a conventional cooker will be described with reference to FIG. 4.

As shown in FIG. 4, in the conventional cooker, a heating chamber 22 is formed, inside an apparatus body 21, with a top plate 23 thereof part of which is formed into a protruding portion serving as a heater cover 24, and a cooking heater 25 is disposed below the heater cover 24. The heater cover 24 is a reflection plate for reflecting heat of the cooling heater 25.

An exhaust duct 26 is provided for exhausting, from the apparatus body 21, air inside the

heating chamber 22; a deodorization catalyst 27 is provided, inside the exhaust duct 26, that removes an odor or a smoke contained in the exhausted air; and a heater 28 is provided for heating the deodorization catalyst 27.

Or, as shown in FIG. 5, instead of providing the heater 28 for heating the deodorization catalyst 27, a heat-conductive member 29 for letting heat of the cooking heater 25 conduct to the deodorization catalyst 27 is formed into part of a side wall of the exhaust duct 26 so as to extend to the heater cover 24.

<Problems to be solved by the utility model>

Until a temperature at which the deodorization catalyst is prepared to exert an odor-removing effect is reached, a cooker as constructed above allows insufficiently deodorized air to be exhausted, with no odoriferous gas in the air sufficiently decomposed.

Moreover, some gas components contained in the exhausted air exhibit decomposition efficiency of 60 to 80 %, which means that even after the temperature permitting the deodorization catalyst to exert the odor-removing effect is reached, 20 to 40 % of the total gas content is exhausted, without being decomposed, from the apparatus body.

<Object>

An object of the present utility model is to provide a cooker that solves the above-described problems.

<Means for solving the problems>

A cooker of the present utility model is provided with: an exhaust fan for exhausting air inside a heating chamber; an exhaust path that guides the air exhausted by the exhaust fan to an outside of the apparatus, and a deodorization catalyst that is provided inside the exhaust path, and that removes an odor or a smoke contained in the exhausted air; a circulation path that is provided in a stage succeeding the deodorization catalyst of the exhaust path, and that lets the exhausted air circulate into the heating chamber; and a switching damper that is provided in a branching portion branching into the circulation path and the exhaust path, and that switches a path guiding the exhausted air between the circulation path and the exhaust path.

<Mode of operation>

With the cooker as described above, when the exhausted air needs to be deodorized because it contains gas generated during cooking, the damper is switched so that the air exhausted by the exhaust fan is guided into the circulation path, and the exhausted air is thus made to repeatedly circulate; thereby, the gas contained in that exhausted air is sufficiently decomposed by the deodorization catalyst, with the result that the exhausted air is deodorized. Then, the damper is switched so that the sufficiently deodorized air is exhausted through the exhaust path.

Moreover, when, depending on the kind of cooking, the air inside the heating chamber needs to be directly exhausted, the damper is switched, so that the air is exhausted through the exhaust path.

<Preferred embodiments>

A cooker according to an embodiment of the present utility model will be described with reference to FIGS. 1 to 3.

As shown in FIGS. 1 to 3, in the cooker of the present utility model, a heating chamber 2 is formed, inside an apparatus body 1, with a top plate 3 thereof part of which is formed into a protruding portion serving as a heater cover 4, and a cooking heater 5 is disposed below the heat cover 4. The heater cover 4 is a reflection plate that reflects heat of the cooking heater 5.

An exhaust opening 6 is provided at a top plate of the heater cover 4, and a deodorization catalyst 7 is disposed at the exhaust opening. A centrifugal exhaust fan 8 for exhausting air inside the heating chamber 2 is disposed above the deodorization catalyst 7.

An exhaust duct 9 guides the air exhausted by the centrifugal exhaust fan 8 to the outside of the cooker 1; the exhaust duct 9 is, at one end thereof, connected to the exhaust opening 6 and is, at the other end thereof, connected to an exhaust port 10 provided in the apparatus body 1.

An exhaust circulation duct 11 is provided for permitting the air exhausted into an area between the centrifugal exhaust fan 8 of the exhaust duct 9 and the exhaust port 10 (namely, a stage succeeding the deodorization catalyst 7) to circulate into the heating chamber 2, and an opening 12 is provided, at a rear surface 13 of the heating chamber 2, that takes, in the heating chamber 2, the exhausted air that is guided by the exhaust circulation duct 11.

In a branching portion branching into the exhaust duct 9 and the exhaust circulation duct 11,

a switching damper 14 is provided that blocks the exhaust port 10 or the exhaust circulation duct 11, and that thereby switches a flow of the exhausted air between the exhaust-port 10 side and the exhaust-circulation-duct 11 side.

Next, an operation of the cooker as constructed above will be described.

First, when cooking is started or in an initial phase, hardly any gas or smoke is generated from foods; thus, the switching damper 14 is placed in a position blocking the exhaust circulation duct 11 or in a middle position as shown in FIG. 2, and the exhaust centrifugal fan 8 is rotated slowly.

When cooking is in progress or in an final phase, the switching damper 14 is switched to a position blocking the exhaust port 10 as shown in FIG. 3 so as to permit the air exhausted by the exhaust centrifugal fan 8 to circulate into the heating chamber 2 through the exhaust circulation duct 11 and the opening 12; thus, gas contained in the exhausted air is decomposed by the deodorization catalyst 7, and heated air inside the heating chamber 2 is prevented from escaping out of the apparatus, leading to reduced time for cooking. On whether the cooking is in progress or in the final phase, a determination is made on the basis of a gas density using a gas sensor, or on the basis of time elapsed for the cooking.

When the cooking is finished, the switching damper 11 is switched so as to block the exhaust circulation duct 11, permitting the air inside the heating chamber 2 to be exhausted.

When heating chamber cleaning is conducted, the switching damper 14 is switched so as to block the exhaust port 10; the cooking heater 5 is turned on with no food placed inside the heating chamber 2 and then heats an interior of the heating chamber 2 whereby odoriferous components adsorbed on wall surfaces and other surfaces in the heating chamber 2 are desorbed; the air inside the heating chamber 2 is made to circulate by the exhaust circulation fan 8; the deodorization catalyst 7 then oxidizes the odoriferous components contained in the air; in this way, the interior of the heating chamber 2 is deodorized.

<Effect of the utility model>

With a cooker having a construction as described above, air inside the heating chamber is made to circulate so that the deodorization catalyst deodorizes it; thus, the gas contained in the

exhausted air can be decomposed surely, leading to satisfactory deodorization of the exhausted air.

4. Brief Description of the Drawings

FIG. 1 is a perspective view of a cooker according to an embodiment of the present utility model;

FIGS. 2 and 3 are cross-sectional views each showing a state switched by a switching damper of the present utility model; and

FIGS. 4 and 5 are cross-sectional views each showing a conventional cooker.

[In the drawings]

1: apparatus body, 2: heating chamber, 4: heater cover, 6: exhaust opening, 7: deodorization catalyst, 8: centrifugal exhaust fan, 9: exhaust duct, 10: exhaust port, 11: exhaust circulation duct, 12: opening, 14: switching damper.

Agent: Patent attorney Masaru Umeda (two others)